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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,470	07/18/2003	Wang-Rae Kim	P-0562	1139
34610	7590	08/10/2005	EXAMINER	
FLESHNER & KIM, LLP P.O. BOX 221200 CHANTILLY, VA 20153			SHINGLETON, MICHAEL B	
			ART UNIT	PAPER NUMBER
			2817	

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/621,470	Applicant(s) KIM, WANG-RAE	
	Examiner Michael B. Shingleton	Art Unit 2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2005.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 18-21, 28-31 and 36-43 is/are pending in the application.
 4a) Of the above claim(s) 2-5 is/are withdrawn from consideration.
 5) ☒ Claim(s) 18-21 is/are allowed.
 6) ☒ Claim(s) 1, 11, 28-31 and 36-43 is/are rejected.
 7) ☒ Claim(s) 6-10 is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7-18-2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1, 11, 28-31, and 36-47 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Wright et al. US2002/0044014 (Wright).

Figures 1-46 and the relevant text of Wright discloses an apparatus and method for reducing power amplifier distortion having a detector 116 that detects a temperature of the amplifier directly or Wright detects the temperature indirectly like in the disclosed invention (See paragraphs [0298] and [0299].) to form temperature compensation coefficient(s) stored in a look-up table like 52H. Wright also discloses a processor, i.e. DCSP 52 "Digital Compensation signal Processor" that clearly adjusts an input signal based on the temperature of the amplifier. The predistorter 52 called a "predistorter kernel" is what modifies the input signal for AM-AM, AM-PM (phase/frequency), "the frequency dependent variation" and the "time hysteresis" (See paragraph [0273] and [0305]). The coefficients to AM-AM non-linearities are directed to a power compensation coefficient(s) since amplitude and power is related. AM-PM non-linearities as noted above and in the previous office action is directed to a phase compensation coefficient(s). The DCSP is also responsive to the input signal $V_m(t)$ and the output signal $V_{m,r}(t)$ or $V_{f,r}(t)$ to modify the input signal for AM-AM, AM-PM (phase/frequency) non-linearities, "the frequency dependent variation" and the "time hysteresis". The coefficients developed for the look-up tables of Wright as a result of this comparison includes phase rotation (See paragraph [0162]). The coefficients formed to correct for phase rotation would also be consider a power/phase coefficient(s). Note that applicant has not defined the term "power/phase coefficient" and thus any coefficient that is formed as a result of phase or power is considered a "power/phase coefficient". Figure 1 of Wright clearly shows the digital nature of the controller and the pre-distorter. Wright specifically recites that the temperature signal is correlated with the input signal (See paragraph [0480]) and thus these two signals are compared in the broad sense in that input signal is examined with respect to the temperature signal. The element 52H is a composition of many look-up tables that are used to control the predistorter. All of these coefficients are stored in the series of look-up tables that make up elements like 52H in Wright. This includes the temperature compensation coefficients and the frequency compensation coefficients and the AM-AM and AM-PM coefficients. The input signal can be called a "training signal" as this signal causes the coefficients to be developed. Wright clearly senses the average power levels and the instantaneous power levels and based upon at least these levels all the coefficients are generated including the frequency and temperature coefficients (See paragraph [0273], [0305] and the entire page 16). Note that single coefficient can be composed of multiple coefficients. Also note that $V_{f,r}(t)$ is fed back and compared to the input (See paragraph [0273] and [0305]) and since these signals change with time new compensation

coefficients are generated. Also note that when the input is first applied, i.e. a training signal, the output of the amplifier is considered to be “pre-compensated” or “SID”. Figures like Figure 7 shows how the instantaneous and average powers are used as an “address”, i.e. a particular power corresponds to a particular point in one look-up table. Also note that in order to compensate for non-linear characteristics with a predistorter like that of Wright the predistorter must provide the inverse of the distortion no matter the source of the distortion (See paragraph [0285]). Thus Wright corrects for amplitude, phase, frequency and temperature either directly or indirectly.

Response to Arguments

Applicant's arguments filed 5-24-2005 have been fully considered but they are not persuasive. Applicant states that “Wright et al. discloses temperature and frequency compensation coefficients... However, it is respectfully noted Wright et al. does not teach or suggest using the claimed temperature, power/phase and frequency coefficients as in the present invention”. The examiner respectfully disagrees. First, ^{Applicant} ~~applicant~~ states that the temperature and frequency compensation coefficients are present in Wright. In fact the temperature coefficients of Wright can be obtain in a manner substantially identical to that of the disclosed invention where the temperature of the power amplifier depends on the average power of the input signal (See the paragraph bridging pages 17 and 18) and paragraph [0298] of Wright. Wright also teaches measuring the temperature directly. Thus the only coefficient applicant believes not to be present is the “power/phase” coefficient. It is noted that applicant has not defined the term “power/phase” and thus a fair and reasonable reading would be power or phase (power/phase). Throughout Wright the use of multidimensional tables are used. A one dimensional data structure is one where the power does not vary (See paragraph [0178]) and thus a multidimensional table is one that does have coefficients that vary with respect to power. Paragraph [0181] addresses that power is measured, the row index is based on the power of the input signal (Paragraph [0182]), the DCSP may deliberately add one or more of the following effects to the input, as required to correct for errors introduced in the analog upconversion and amplification path; phase rotation, propagation delay, amplitude gains, DC offsets... (See Paragraph [0162]), $V_m(t)$ and $V_r(t)$ determine the level of imperfection in the amplification process for which correction is needed including AM-AM and AM-PM (See paragraph [0167]). Thus the coefficients obtained in Wright are temperature, frequency and “power/phase” coefficients. AM-PM nonlinearity and the coefficient that is generated from the above comparison is a phase coefficient.

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Claims 6-10, objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 18-21^{are} allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal, can be reached on (571)272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306 and after July 15, 2005 the fax number will be 571-273-8300. Note that old fax number (703-872-9306) will be service until September 15, 2005.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS
August 5, 2005


Michael B Shingleton
Primary Examiner
Group Art Unit 2817